Space Weather Forecast

Issued on Monday, 15 August 2022 at 13:28 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Minor Geomagnetic Storms likely on day 3 (17th). Chance of Moderate flares (R1-R2 Radio blackouts) throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours, with occasional Common-class flares. There are currently five sunspot regions on the visible disc. Some of these are of interest displaying relatively complex magnetic structure. A Coronal Mass Ejection (CME) that occurred from the northwest quadrant at 14/1200 UTC has been analysed and is forecast to Earth early on day 3 (17th Aug). Another CME occurred from a filament eruption in the southwest quadrant at around 15/0500 UTC. There is the potential for this to have an Earth directed component but will require further analysis once imagery becomes available.

Solar Wind / Geomagnetic Activity: The solar wind is showing a slightly elevated wind environment, with speeds 450-500km/s. The total magnetic field was weak throughout with only weak variations in the important north-south component. Geomagnetic activity was Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to remain predominantly Low, although there is a chance of it increasing to Moderate at times.

Solar Wind / Geomagnetic Activity: Solar winds are expected to be close to background levels on days 1 and 2 (15th and 16th). On day 3 (17th), Earth is expected to connect with the fast winds from a coronal hole. This enhancement is likely to be further enhanced by a CME, which is forecast to impact Earth around the same time frame. Geomagnetic activity is expected to be mainly Quiet, with isolated Unsettled intervals through the next two days. On day 3 (17th), activity is expected to become Unsettled to Active, and a Minor Storm interval is likely. There is also a slight chance of a Moderate Storm in association with the CME arrival.

Energetic Particles / Solar Radiation: Solar radiation storms are unlikely, but there is a slight chance of an S1 or greater event due to the more complex regions on the visible side of the solar disc.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	10	60	30
Strong	G3	No	1	1	20	5
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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